SEQUENCE LISTING

<110> Meyers, Rachel Cook, William James Williamson, Mark Rudolph-Owen, Laura A. Gimeno, Ruth
<120> 32142, 21481, 25964, 21686, NOVEL DEHYDROGENASE MOLECULES AND USES THEREFOR
<130> MNI-134CP2
<140> <141>
<150> 09/816,760 <151> 2001-03-23
<150> 09/634,955 <151> 2000-08-08
<150> 60/192,002 <151> 2000-03-24
<160> 16
<170> PatentIn Ver. 2.0
<210> 1 <211> 2660 <212> DNA <213> Homo sapiens
<220> <221> CDS <222> (63)(2468)
<220> <221> misc_feature <222> (1)(2660) <223> All occurrences of n = any nucleotide
<400> 1 cettining caegegies agagegees geagietieg eggaaagegi teggggiagg 60
cg atg gct gcg acg cgt gca ggg ccc cgc gcc cgc gag atc ttc acc 107 Met Ala Ala Thr Arg Ala Gly Pro Arg Ala Arg Glu Ile Phe Thr 15 10
tcg ctg gag tac gga ccg gtg ccg gag agc cac gca tgc gca ctg gcc 155 Ser Leu Glu Tyr Gly Pro Val Pro Glu Ser His Ala Cys Ala Leu Ala 20 25 30
tgg ctg gac acc cag gac cgg tgc ttg ggc cac tat gtg aat ggg aag 203 Trp Leu Asp Thr Gln Asp Arg Cys Leu Gly His Tyr Val Asn Gly Lys 35 40 45
tgg tta aag cct gaa cac aga aat tca gtg cct tgc cag gat ccc atc 25: Trp Leu Lys Pro Glu His Arg Asn Ser Val Pro Cys Gln Asp Pro Ile 50 55 60

aca Thr	gga Gly 65	gag Glu	aac Asn	ttg Leu	gcc Ala	agt Ser 70	tgc Cys	ctg Leu	ca Gl:	g g n A	ca (la (cag Gln 75	gcc Ala	gag Glu	ga As	at (gtg Val		299
gct Ala 80	gca Ala	gcc Ala	gtg Val	gag Glu	gca Ala 85	gcc Ala	agg Arg	atg Met	gc Al	a r	tt he 90	aag Lys	ggc Gly	tgç	j aq	gt (er .	gcg Ala 95		347
cac His	ccc Pro	ggc Gly	gtc Val	gtc Val 100	cgg Arg	gcc Ala	cag Gln	cac His	ct Le 10	uı	cc hr	agg Arg	ctg Leu	gco Ala		ag lu 10	gtç Val	ı L	395
atc Ile	cag Gln	aag Lys	cac His 115	Gln	cgg Arg	ctg Leu	ctg Leu	tgg Trp 120	11:	c c ir I	ctg Leu	gaa Glu	tcc Ser	cte Le		tg al	act Thi	ī.	443
ggg Gly	cgg Arg	gct Ala 130	gtt Val	cga Arg	gag Glu	gtt Val	cga Arg 135	Asp	gg G]	ly A	gac Asp	gtc Val	caç Glr 140	ı be	gg	ıcc	ca Gl:	g n	491
cag Gln	ctg Leu 145	Leu	c cac u His	tac Tyr	cat His	gca Ala 150	116	caç Glr	g go n Al	ca t la :	tcc Ser	acc Thr 155	GII	g ga n Gl	g g u (gag Glu	gc Al	a a	539
ctg Leu 160	Ala	gg Gl	e tgq y Trp	g gaç o Glu	g ccc i Pro 165) Met	gga Gly	a gta 7 Val	a a l I	те	ggc Gly 170	cto	ate	c ct e Le	g d eu l	cca Pro	cc Pr 17	-	587
aca Thr	tto Phe	c to e Se	c tte r Phe	c cti e Lei 180	ı Glu	g ato 1 Met	ato Me	g tg	рА	gg rg 85	att Ile	tgo Cys	c cc s Pr	t go o Al	Lu	ctg Leu 190		t .a	635
gto Val	g gg	c tg y Cy	c ac s Th	r Va	g gto 1 Vai	g gco	c ct	c gt u Va 20	1 F	cc ro	ccg Pro	gco Al	c to a Se	т г.	eg ro 05	gcg Ala	Pi	cc	683
cto Le	c ct u Le	c ct u Le 21	g gc u Al	с са a Gl	g ct n Le	g gc u Al	g gg a Gl 21	À GI	ig (.u I	ctg Leu	G17	c cc 7 Pr	c tt o Ph 22	10 I	cg ro	gga Gly	at 7 I	tc le	731
ct. Le	g aa u As 22	n Va	c gt al Va	c ag il Se	t gg r Gl	c cc y Pr 23	o Al	g to .a Se	ec o	ctg Leu	gto Val	g co l Pr 23	0 13	c c le L	tg eu	gco	e t	cc er	779
ca Gl 24	n Pr	t go	ga at Ly Il	c co Le Ai	gg aa g Ly 24	rs Va	g go	c ti La Pl	tc he	tgc Cys	gg G1 25	у у	a P	cg ç ro G	gag Slu	ga: Gl:	~ ~	gg 1y :55	827
cg Ar	gt go g Al	cc c	tt co	rg A	gg ag rg Se 60	gc ct er Le	g go eu Al	cg g la G	ga ly	gag Glu 265	ι Су	t go	cg g La G	ag d lu 1	ctg Leu	gg G1 27	у -	tg Leu	875
go Al	eg ci La Lo	tg g eu G	gg a ly T 2	cg g hr G 75	ag to lu So	eg ci	tg c eu L	eu L	tg eu 80	ctg Lev	g ac	g ga	ac a sp T	111	gcg Ala 285		c q	gta Val	923
ga A:	ac t sp S	er A	cc g la V 90	tg g al G	ag g lu G	gt g ly V	aı v	tg g al A 95	ısp	gco	c go a Al	cc t la T	rb -	cc Ser 300	gac Asp	co Ar	g (ggc Gly	971

ccg Pro	ggt Gly 305	ggc Gly	ctc Leu	agg Arg	Leu	ctc Leu 310	atc Ile	cag Gln	gag Glu	tct Ser	gtg Val 315	tgg Trp	gat Asp	gaa Glu	gcc Ala	1019
atg Met 320	aga Arg	cgg Arg	ctg Leu	cag Gln	gag Glu 325	cgg Arg	atg Met	ggg Gly	cgg Arg	ctt Leu 330	cgg Arg	agt Ser	ggc Gly	cga Arg	ggg Gly 335	1067
ctg Leu	gat Asp	GJ A GG A	gcc Ala	gtg Val 340	gac Asp	atg Met	gly	gcc Ala	cgg Arg 345	gly ggg	gct Ala	gcc Ala	gca Ala	tgt Cys 350	gac Asp	1115
ctg Leu	gtc Val	cag Gln	cgc Arg 355	ttt Phe	gtg Val	cgt Arg	gag Glu	gcc Ala 360	cag Gln	agc Ser	cag Gln	ggt Gly	gca Ala 365	cag Gln	gtg Val	1163
ttc Phe	cag Gln	gct Ala 370	Gly	gat Asp	gtg Val	cct Pro	tcg Ser 375	gaa Glu	cgc Arg	cca Pro	ttc Phe	tat Tyr 380	ccc Pro	cca Pro	acc Thr	1211
ttg Leu	gtc Val 385	tcc Ser	aac		ccc Pro	cca Pro 390	gcc Ala	tcc Ser	cca Pro	tgt Cys	gcc Ala 395	GIN	gtg Val	gag Glu	gtg Val	1259
ccg Pro 400	Trp	cct	gto Val	gtc Val	gtg Val 405	gcc Ala	tcc Ser	ccc	ttc Phe	cgc Arg 410	Thr	gcc Ala	aag Lys	gag Glu	gca Ala 415	1307
ctç Lev	ı ttg ı Leu	gto Val	g gco L Ala	a aac a Asn 420	Gly	acg Thr	ccc Pro	cgc Arg	ggg Gly 425	GLY	agc Ser	gcc Ala	agt Ser	gtg Val 430	tgg Trp	1355
ago Sei	gaç Glu	ago Aro	g cto g Leo 43	رGl د	g cag g Gln	gcg Ala	ctg Leu	gag Glu 440	Leu	ggc Gly	tat Tyr	ggg Gly	ctc Leu 445	GII	g gtg n Val	1403
ggo Gl	c act y Thi	gt Va 45	l Tr	g ato p Ile	aac Asn	gco Ala	cac His 455	s Gly	cto Lev	aga 1 Arg	a gad gʻAsp	c cct p Pro 460	Ser	gto Val	g ccc L Pro	1451
Th	r Gly	y Gl	у Су	c aad s Ly:	s Glu	g agt a Sea 470	c Gly	g tgt y Cys	tco Sei	c tgg	g cae p Hi: 47	s GT	A el?	c cca / Pro	a gac o Asp	1499
gg G1 48	y Le	g ta u Ty	t ga r Gl	g ta u Ty	t cto r Lev 48	ı Ar	g cc	c tca o Sei	a ggo	g aco y Th 49	r Pr	t gco o Ala	c cgg	g cto g Le	g tcc u Ser 495	1547
tg Cy	c ct s Le	c to u Se	ec aa er Ly	g aa s As 50	n Le	g aa u As	c ta n Ty	t gad r As	c ac p Th 50	r Ph	t gg e Gl	c ct y-Le	c gc	t gt a Va 51	g ccc 1 Pro 0	1595
to Se	a ac r Th	c ct r Le	g co eu Pi 51	o Al	t gg a Gl	g cc y Pr	t ga o Gl	a at u Il 52	e Gl	g cc	c ag o Se	c cc r Pr	a gc o Al 52	a Pr	c ccc o Pro	1643
ta Ty	it gg /r Gl	y Le	cc ti eu Pl 30	c gt ne Va	t gg il Gl	g gg y Gl	c cg y Ar 53	g Ph	c ca e Gl	g gc .n Al	t co .a Pr	et gg o Gl 54	у Ат	c cg a Ar	ga agc g Ser	1691

tcc a	agg Arg 545	ccc Pro	atc Ile	cgg Arg	Asp	tcg Ser 550	tct Ser	ggc Gly	aat Asn	cto	ו תו	at g is G	gc Sly	tac Tyr	gtg Val	gct Ala	1739
gag (Glu (560	ggt Gly	gga Gly	gcc Ala	aag Lys	gac Asp 565	atc Ile	cga Arg	ggt Gly	gct Ala	gt@ Va] 570	L G.	ag ç lu <i>F</i>	gcc Ala	gct Ala	cac His	cag Gln 575	1787
gct Ala	ttc Phe	cct Pro	ggc Gly	tgg Trp 580	gcg Ala	ggc Gly	cag Gln	tcc Ser	cca Pro 585	GT.	ago yA.	cc d la <i>l</i>	cgg Arg	gca Ala	gcc Ala 590	ctg Leu	1835
ctg Leu	tgg Trp	gcc Ala	ctg Leu 595	gcg Ala	gct Ala	gca Ala	ctg Leu	gag Glu 600	cgc Arg	cg Ar	ga gL	ag ys :	tct Ser	acc Thr 605	ctg Leu	gcc Ala	1883
tca Ser	agg Arg	ctg Leu 610	Glu	agg Arg	cag Gln	gga Gly	gcg Ala 615	GIU	cto	aa Ly	g g s A	ila .	gcg Ala 620	gag Glu	gcg Ala	gag Glu	1931
gtg Val	gag Glu 625	ctg Leu	agc Ser	gca Ala	aga Arg	cga Arg 630	Leu	cgg Arg	gce	g tg a Tr	р	199 51 y 53 5	gcc Ala	cgg Arg	gtg Val	cag Gln	1979
gcc Ala 640	caa Gln	ggc Gly	cac His	acc Thr	ctg Leu 645	Gln	gta Val	gcc Ala	gg Gl	g ct y Le 65	eu <i>F</i>	aga Arg	ggc Gly	.cct Pro	gto Val	ctg Leu 655	2027
cgc Arg	ctg Leu	cgo Aro	g gaq g Glu	g ccg ı Pro 660	Leu	ggt Gly	gto Val	g cto L Lev	g gc 1 Al 66	a va	ig q	gtg Val	tgt Cys	ccg Pro	gaq Ası 670	gag Glu	2075
tgg Trp	ccc	cto Le	g cti u Lei 67	u Ala	tto a Phe	gtç Val	g tc	c cto r Leo 680	ı Le	g g u A	ct (ccc Pro	gcc	cto Lev 685	J AL	c tac a Tyr	2123
ggc Gly	aac Ası	ac n Th 69	r Va	g gte 1 Va	c ato	g gto	g cc l Pr 69	o Se:	t go r Al	gg .a.A	cc la	tgt Cys	cct Pro 700	у пе	g ct u Le	g gco u Ala	2171
ctç Lev	g ga n Gl: 70	u Va	c tg 1 Cy	c ca s Gl	n Ası	o Me	t Al	c ac a Th	r Va	ar b	'ne	Pro	HI.	a gg a Gl	c ct y Le	g gco u Ala	2219 a
aad Asr 720	n Va	g gt 1. Va	g ac	a gg ir Gl	a ga y As 72	p Ar	g ga g As	ıc ca sp Hi	t ct	eu 1	hcc hr	cgc Arg	tg Cy	c ct s Le	g gc u Al	c tte a Le	u
cac Hi:	c ca s Gl	a ga n As	ic gt sp -Va	c ca al Gl 74	n Al	c at a Me	g to	gg ta cp Ty	r P	tc c he 0 45	gga Gly	tca Ser	a gc	c ca a Gl	.11 G.	gt tc Ly Se 50	c 2315 r
ca Gl:	g tt n Ph	ie Vá	al G	ag to Lu Ti 55	gg gc	c to a Se	eg ge	la GJ	ga a Ly A 60	ac o sn 1	ctc Leu	aaa Lys	a co s Pr	eg gt eo Va 76	11 L	gg gc rp Al	g 2363 a
ag Se	c aç	g G	gc to ly C 70	gc co ys Pi	eg eg	gg ge	la T	gg ga rp A: 75	ac c sp G	ag In	gag Glu	gc. Al	a G.	ag go Lu Gi 30	ly A	ca gọ la Gl	јс 2411 -У

cca gag ctg ggg ctg cga gtg gcg cgg acc aag gcc ctg tgg ctg cct 2459 Pro Glu Leu Gly Leu Arg Val Ala Arg Thr Lys Ala Leu Trp Leu Pro 785 790

atg ggg gac tgatgcctga gcgccaccta ctgcattttg gacacctcac 2508 Met Gly Asp 800

<210> 2 <211> 802 <212> PRT <213> Homo sapiens

<400> 2 Met Ala Ala Thr Arg Ala Gly Pro Arg Ala Arg Glu Ile Phe Thr Ser $1 \ 5 \ 10 \ 15$

Leu Glu Tyr Gly Pro Val Pro Glu Ser His Ala Cys Ala Leu Ala Trp 20 25 30

Leu Asp Thr Gln Asp Arg Cys Leu Gly His Tyr Val Asn Gly Lys Trp 35 40 45 .

Leu Lys Pro Glu His Arg Asn Ser Val Pro Cys Gln Asp Pro Ile Thr 50 55 60

Gly Glu Asn Leu Ala Ser Cys Leu Gln Ala Gln Ala Glu Asp Val Ala 65 70 75 80

Ala Ala Val Glu Ala Ala Arg Met Ala Phe Lys Gly Trp Ser Ala His 85 90 95

Pro Gly Val Val Arg Ala Gln His Leu Thr Arg Leu Ala Glu Val Ile 100 105 110

Gln Lys His Gln Arg Leu Leu Trp Thr Leu Glu Ser Leu Val Thr Gly 115 120 125

Arg Ala Val Arg Glu Val Arg Asp Gly Asp Val Gln Leu Ala Gln Gln 130 135 140

Leu Leu His Tyr His Ala Ile Gln Ala Ser Thr Gln Glu Glu Ala Leu 145 150 150 155

Ala Gly Trp Glu Pro Met Gly Val Ile Gly Leu Ile Leu Pro Pro Thr 165 170 175 ,

Phe Ser Phe Leu Glu Met Met Trp Arg Ile Cys Pro Ala Leu Ala Val 180 185 190

Gly Cys Thr Val Val Ala Leu Val Pro Pro Ala Ser Pro Ala Pro Leu 195 200 205 Leu Leu Ala Gln Leu Ala Gly Glu Leu Gly Pro Phe Pro Gly Ile Leu 210 215 220

Asn Val Val Ser Gly Pro Ala Ser Leu Val Pro Ile Leu Ala Ser Gln 225 230 235 240

Pro Gly Ile Arg Lys Val Ala Phe Cys Gly Ala Pro Glu Glu Gly Arg 245 250 255

Ala Leu Arg Arg Ser Leu Ala Gly Glu Cys Ala Glu Leu Gly Leu Ala 260 265 270

Leu Gly Thr Glu Ser Leu Leu Leu Leu Thr Asp Thr Ala Asp Val Asp 275 286 285

Ser Ala Val Glu Gly Val Val Asp Ala Ala Trp Ser Asp Arg Gly Pro 290 295 . 300

Gly Gly Leu Arg Leu Leu Ile Gln Glu Ser Val Trp Asp Glu Ala Met 305 310 315

Arg Arg Leu Gln Glu Arg Met Gly Arg Leu Arg Ser Gly Arg Gly Leu 325 330 335

Asp Gly Ala Val Asp Met Gly Ala Arg Gly Ala Ala Ala Cys Asp Leu 340 345 350

Val Gln Arg Phe Val Arg Glu Ala Gln Ser Gln Gly Ala Gln Val Phe 355 360 365

Gln Ala Gly Asp Val Pro Ser Glu Arg Pro Phe Tyr Pro Pro Thr Leu 370 375 380

Val Ser Asn Leu Pro Pro Ala Ser Pro Cys Ala Gln Val Glu Val Pro 385 390 395 400

Trp Pro Val Val Val Ala Ser Pro Phe Arg Thr Ala Lys Glu Ala Leu 405 410 415

Leu Val Ala Asn Gly Thr Pro Arg Gly Gly Ser Ala Ser Val Trp Ser 420 425 430

Glu Arg Leu Gly Gln Ala Leu Glu Leu Gly Tyr Gly Leu Gln Val Gly 435 440 445

Thr Val Trp Ile Asn Ala His Gly Leu Arg Asp Pro Ser Val Pro Thr 450 455 460

Gly Gly Cys Lys Glu Ser Gly Cys Ser Trp His Gly Gly Pro Asp Gly 465 47.0 475

Leu Tyr Glu Tyr Leu Arg Pro Ser Gly Thr Pro Ala Arg Leu Ser Cys
485 490 495

Leu Ser Lys Asn Leu Asn Tyr Asp Thr Phe Gly Leu Ala Val Pro Ser 500 505

Thr Leu Pro Ala Gly Pro Glu Ile Gly Pro Ser Pro Ala Pro Pro Tyr 515 520 525

Gly Leu Phe Val Gly Gly Arg Phe Gln Ala Pro Gly Ala Arg Ser Ser 530 540

Arg Pro Ile Arg Asp Ser Ser Gly Asn Leu His Gly Tyr Val Ala Glu 545 550 555 560

Gly Gly Ala Lys Asp Ile Arg Gly Ala Val Glu Ala Ala His Gln Ala 565 570 575

Phe Pro Gly Trp Ala Gly Gln Ser Pro Gly Ala Arg Ala Ala Leu Leu 580 585 590

Trp Ala Leu Ala Ala Leu Glu Arg Arg Lys Ser Thr Leu Ala Ser 595 600 605

Arg Leu Glu Arg Gln Gly Ala Glu Leu Lys Ala Ala Glu Ala Glu Val 610 615 620

Glu Leu Ser Ala Arg Arg Leu Arg Ala Trp Gly Ala Arg Val Gln Ala 625 630 635 640

Gln Gly His Thr Leu Gln Val Ala Gly Leu Arg Gly Pro Val Leu Arg 645 650 . 655

Leu Arg Glu Pro Leu Gly Val Leu Ala Val Val Cys Pro Asp Glu Trp 660 665 670

Pro Leu Leu Ala Phe Val Ser Leu Leu Ala Pro Ala Leu Ala Tyr Gly 675 680 685

Asn Thr Val Val Met Val Pro Ser Ala Ala Cys Pro Leu Leu Ala Leu 690 700

Glu Val Cys Gln Asp Met Ala Thr Val Phe Pro Ala Gly Leu Ala Asn 705 710 715 720

Val Val Thr Gly Asp Arg Asp His Leu Thr Arg Cys Leu Ala Leu His 725 730 735

Gln Asp Val Gln Ala Met Trp Tyr Phe Gly Ser Ala Gln Gly Ser Gln 740 745 750

Phe Val Glu Trp Ala Ser Ala Gly Asn Leu Lys Pro Val Trp Ala Ser 755 760 765

Arg Gly Cys Pro Arg Ala Trp Asp Gln Glu Ala Glu Gly Ala Gly Pro 770 780

Glu Leu Gly Leu Arg Val Ala Arg Thr Lys Ala Leu Trp Leu Pro Met 785 790 795 800

Gly Asp

<210> 3

<211> 2406

<212> DNA

<213> Homo sapiens

<220> <221> CDS <222> (1)(2406)	
<400> 3 atg gct gcg acg cgt gca ggg ccc cgc gcc cgc gag atc ttc acc tcg 4 Met Ala Ala Thr Arg Ala Gly Pro Arg Ala Arg Glu Ile Phe Thr Ser 1 5 10 15	8
ctg gag tac gga ccg gtg ccg gag agc cac gca tgc gca ctg gcc tgg 9 Leu Glu Tyr Gly Pro Val Pro Glu Ser His Ala Cys Ala Leu Ala Trp 20 25 30	6
ctg gac acc cag gac cgg tgc ttg ggc cac tat gtg aat ggg aag tgg $$ Leu Asp Thr Gln Asp Arg Cys Leu Gly His Tyr Val Asn Gly Lys Trp $$ 35 $$ 40 $$ 45	144
tta aag cct gaa cac aga aat tca gtg cct tgc cag gat ccc atc aca leu Lys Pro Glu His Arg Asn Ser Val Pro Cys Gln Asp Pro Ile Thr	192
gga gag aac ttg gcc agt tgc ctg cag gca cag gcc gag gat gtg gct Gly Glu Asn Leu Ala Ser Cys Leu Gln Ala Gln Ala Glu Asp Val Ala 65 70 75 80	240
gca gcc gtg gag gca gcc agg atg gca ttt aag ggc tgg agt gcg cac Ala Ala Val Glu Ala Ala Arg Met Ala Phe Lys Gly Trp Ser Ala His 85 90 95	288
ccc ggc gtc gtc cgg gcc cag cac ctg acc agg ctg gcc gag gtg atc Pro Gly Val Val Arg Ala Gln His Leu Thr Arg Leu Ala Glu Val Ile 100 105 110	336
cag aag cac cag cgg ctg ctg tgg acc ctg gaa tcc ctg gtg act ggg Gln Lys His Gln Arg Leu Leu Trp Thr Leu Glu Ser Leu Val Thr Gly 115 120 125	384
cgg gct gtt cga gag gtt cga gac ggg gac gtc cag ctg gcc cag cag Arg Ala Val Arg Glu Val Arg Asp Gly Asp Val Gln Leu Ala Gln Gln 130 135	432
ctg ctc cac tac cat gca atc cag gca tcc acc cag gag gag gca ctg Leu Leu His Tyr His Ala Ile Gln Ala Ser Thr Gln Glu Glu Ala Leu 145 150 155 160	480
gca ggc tgg gag ccc atg gga gta att ggc ctc atc ctg cca ccc aca Ala Gly Trp Glu Pro Met Gly Val Ile Gly Leu Ile Leu Pro Pro Thr 165 170	528
ttc tcc ttc ctt gag atg atg tgg agg att tgc cct gcc ctg gct gtg Phe Ser Phe Leu Glu Met Met Trp Arg Ile Cys Pro Ala Leu Ala Val 180 185 190	576
ggc tgc acc gtg gtg gcc ctc gtg ccc ccg gcc tcc ccg gcg ccc ctc Gly Cys Thr Val Val Ala Leu Val Pro Pro Ala Ser Pro Ala Pro Leu 195 200 205	624
ctc ctg gcc cag ctg gcg ggg gag ctg ggc ccc ttc ccg gga atc ctg Leu Leu Ala Gln Leu Ala Gly Glu Leu Gly Pro Phe Pro Gly Ile Leu 210 215 220	672

aat Asn 225	gtc Val	gtc Val	agt Ser	ggc Gly	cct Pro 230	gcg Ala	tcc Ser	ctg Leu	gtg Val	ccc Pro 235	atc Ile	ctg Leu	gco	e t	.cc Ser	cag Gln 240	720	
cct Pro	gga Gly	atc Ile	cgg Arg	aag Lys 245	gtg Val	gcc Ala	ttc Phe	tgc Cys	gga Gly 250	gcc Ala	ccg Pro	gag Glu	gaa Glu	1 C	199 51y 255	cgt Arg	768	
gcc Ala	ctt Leu	cga Arg	cgg Arg 260	agc Ser	ctg Leu	gcg Ala	gga Gly	gag Glu 265	tgt Cys	gcg Ala	gag Glu	ctg Leu	99 G1 27	ÀΙ	ctg Leu	gcg Ala	816	
ctg Leu	Gly ggg	acg Thr 275	gag Glu	tcg Ser	ctg Leu	ctg Leu	ctg Leu 280	ctg Leu	acg Thr	gac Asp	acg Thr	gcg Ala 285	AS	b į	gta Val	gaç Asp	864	
tcg Ser	gcc Ala 290	gtg Val	gag Glu	ggt Gly	gtc Val	gtg Val 295	gac Asp	gcc Ala	gcc Ala	tgg Trp	tcc Ser 300	ASE	c cg Ar	c (ggc Gly	Pro	912	
ggt Gly 305	ggc Gly	ctc Leu	agg Arg	ctc Leu	ctc Leu 310	atc Ile	cag Gln	gag Glu	tct Ser	gtg Val 315	Trp	gat Ası	ga Gl	a u	gcc Ala	ato Med 320	-	
aga Arg	cgg Arg	ctg Leu	cag Gln	gag Glu 325	cgg Arg	atg Met	ggg	cgg Arg	ctt Leu 330	Arg	agt Sei	gg Gl	c cç y Ar	ja :g	ggg Gly 335	ье	g 1008 u	í
gat Asp	ggg Gly	gcc Ala	gtg Val	. Asp	atg Met	ggg Gly	gcc Ala	cgg Arg 345	GTZ	gct Ala	gce Ala	c gc a Al	a to a Cy 35	/S	gac Asp	ct Le	g 1056 u	5 .
gto Val	c cag . Gln	cgc Arg 355	g Phe	gtç Val	g cgt Arg	gag Glu	gcc Ala 360	Gln	ago Sei	caç Glr	g gg n Gl	t gc y Al 36	aG.	ag ln	gtç Val	tt. Ph	c 1104 e	1
caç Glr	g gct n Ala 370	Gl	t gat y Ası	t gto o Val	g cct L Pro	tcg Ser 375	Glu	cgc Arg	cca g Pro	a tto D Phe	ta Ty 38	r Pr	c co	ca ro	acc Thi	tt Le	g 1153 u	2
gto Val 38	l Sei	c aac	n Le	u Pro	c cca 5 Pro 390	o Ala	a Ser	Pro	с Су	s Ala	a GI	g gt n Va	g g il G	ag lu	gto Va	g co L Pi 40	.0	0
tg: Tr:	g cc p Pro	t gt o Va	g gt 1 Va	c gto 1 Va 40	g gco 1 Ala 5	c tco a Sei	c ccc	c tto Phe	c cg e Ar 41	g Th	a go r Al	c aa .a Ly	ag g ys G	ag lu	gca Ala 41	а ь	.g 124 eu	8
tt Le	g gt u Va	g gc l Al	c aa a As 42	n Gl	g ac y Th	g cce r Pre	c cg	c gg g G1 42	y GΙ	c ag y Se	c go r Al	cc aq La Se	er v	tg al	TI	g a p S	gc 129 er	6
ga Gl	g ag u Ar	g ct g Le 43	u Gl	g ca y Gl	g gc n Al	g ct a Le	g ga u Gl 44	u Le	g gg u Gl	c ta y Ty	t go r G	ra r	tc c eu C 45	ag Sln	gt Va	g g l G	gc 134 ly	. 4
ac Th	t gt r Va 45	l Tr	gg at	c aa le As	c gc n Al	c ca a Hi 45	s Gl	c ct y Le	c ag u Ar	ja ga ng As	sp P	ct t ro S 60	cg q er V	gtg /al	, cc . Pr	c a	ca 139 hr	}2

ggc Gly 465	ggc Gly	tgc C y s	aag Lys	gag Glu	agt Ser 470	ggg Gly	tgt Cys	tcc Ser	tgg Trp) n.	ac ç is C 75	gly ggg	ggc Gly	cca Pro	ga As		180 31 A 133	1440
ctg Leu	tat Tyr	gag Glu	tat Tyr	ctg Leu 485	cgg Arg	ccc Pro	tca Ser	GJ y ggg	acc Thi 490	L E.	ct o	gcc Ala	cgg Arg	ctg Leu	Se 49		gc Cys	1488
ctc Leu	tcc Ser	aag Lys	aac Asn 500	Leu	aac Asn	tat Tyr	gac Asp	acc Thr 505	tt! Phe	t g e G	gc (ctc Leu	gct Ala	gtg Val 510		cc f	ca Ser	1536
acc Thr	ctg Leu	ccg Pro	Ala	ggg Gly	cct Pro	gaa Glu	ata Ile 520	Gīy ggg	CC.	c a o S	igc Ser	cca Pro	gca Ala 525	ecc) P:	ro	tat Tyr	1584
ggg	ctc Leu 530	Phe	gtt Val	ggg Gl	g ggc Gly	cgt Arg 535	ttc Phe	cag Gln	gc Al	t c a F	cct Pro	ggg Gly 540	gcc Ala	cga Arg	a a g S	gc er	tcc Ser	1632
agg Arg 545	Pro	ato	c cgq	g gat g Ası	t tog Ser 550	Ser	ggc Gly	aat Asr	ct Le	eu r	cat His 555	ggc Gly	tac Tyr	gto Va	g g 1 A	ct la	gag Glu 560	1680
ggt	gga Gly	a gc	c aac a Ly:	g ga s As 56	p Ile	c cga e Arq	a ggt g Gly	gct Ala	gt a Va 57	11 (gag Glu	gcc Ala	gct Ala	ca Hi		ag 31n 575	gct Ala	1728
tto Phe	c cci	t gg o Gl	c tg y Tr 58	p Al	g gg a Gl	c cad y Gl	g tco n Sei	c cca r Pre 58	O . G.	ga (ly /	gcc Ala	cgg Arg	gca Ala	a gc a Al 59	a i	ctg Leu	ctg Leu	1776
tg: Tr	g gc p Al	c ct a Le 59	u Al	g gc a Al	t gc a Al	a ct a Le	g gad u Glu 60	u Ar	c co	gg rg	aag Lys	tct Ser	ace Th:	r re	g q u l	gcc Ala	tca Ser	1824
ag Ar	g ct g Le 61	u Gl	g ag .u Ar	g ca	ig gg .n Gl	a gc y Al 61	g ga a Gl 5	g ct u Le	c a u L	ag ys	gct Ala	gc Ala 620	3 GT	g go u Al	g (La (gag Glu	gtg Val	1872
ga Gl 62	u Le	g aç u Se	gc gc er Al	a aq La Ai	ca Ar	g Le	t cg u Ar	g Al	.a T	rp	GTA	AI	a AL	gva	ig al	cag Gln	gcc Ala 640	
ca Gl	a gg .n Gl	jc ca	ac ac is Tl	ar L	ig ca eu Gl 45	ag gt In Va	a go al Al	c gg .a Gl	ra r	etg Leu 550	aga	a gg g Gl	c cc y Pr	t g o V	tg al	cto Let 655	g cgc i Arg	1968
ct Le	ig co eu Ai	gg g	lu P	cg c ro L 60	tg go eu G	gt gi ly Va	ig ct al Le	eu A.	ct q la V 65	gtg Val	gto Val	g tg l Cy	t co 's Pi	OA	ac sp 70	gaç	g tgg ı Trp	2016
Co P:	cc c	eu L	tt g eu A 75	cc t la P	tc g he V	tg to	er L	tg c eu L 80	tg q eu <i>l</i>	gct Ala	cc Pr	c gc	a re	tg g eu A 85	cc la	ta Ty:	c ggo r Gly	2064 V
a A	sn T	ct g hr V 90	tg g al V	tc a al M	tg g let V	al P	cc a ro S 95	gt g er A	cg la	gcc Ala	tg Cy	SPI	ct c ro L	tg c eu I	tg Leu	gc Al	c cto a Le	g 2112 u

gag gtc tgc cag gac atg gcc acc gtg ttc cca gca ggc ctg gcc aac Glu Val Cys Gln Asp Met Ala Thr Val Phe Pro Ala Gly Leu Ala Asn 705 710 715 720	2160
gtg gtg aca gga gac cgg gac cat ctg acc cgc tgc ctg gcc ttg cac Val Val Thr Gly Asp Arg Asp His Leu Thr Arg Cys Leu Ala Leu His 725 730 735	2208
caa gac gtc cag gcc atg tgg tat ttc gga tca gcc cag ggt tcc cag Gln Asp Val Gln Ala Met Trp Tyr Phe Gly Ser Ala Gln Gly Ser Gln 740 745 750	2256
ttt gtc gag tgg gcc tcg gca gga aac ctc aaa ccg gtg tgg gcg agc Phe Val Glu Trp Ala Ser Ala Gly Asn Leu Lys Pro Val Trp Ala Ser 755 760 765	2304
agg ggc tgc ccg cgg gcc tgg gac cag gag gcc gag ggg gca ggc cca Arg Gly Cys Pro Arg Ala Trp Asp Gln Glu Ala Glu Gly Ala Gly Pro 770 775 780	2352
gag ctg ggg ctg cga gtg gcg cgg acc aag gcc ctg tgg ctg cct atg Glu Leu Gly Leu Arg Val Ala Arg Thr Lys Ala Leu Trp Leu Pro Met 785 790 795 800	2400
ggg gac Gly Asp	2406
<210> 4 <211> 1379 <212> DNA <213> Homo sapiens	
<220> <221> CDS <222> (331)(1263)	
<220> <221> misc_feature <222> (1)(1379) <223> All occurrences of n = any nucleotide	
<400> 4 tttggccctc gaggccaaga attcggcacg aggagcaagt ggccttaaca catggatttt	60
cttccaaaaa tgcagaccca ttttaattaa gtttgtaatt aaccactggg gagggcaggc	
cccctggatt cggtctgctt tcggagacac tgtgagtaac ttcctatttg ttgaacattt	180
ggggattagc acgcccactg ggtgttcagc ttggaggctt gcacagagct gagctccctg	240
cagcettggg cetececetg ecetgggagt ectgateage gtetetttge aaagecaate	300
cccttttact ccgttgtccc ccagaacaag atg gga gtc atg gcc atg ctg atg Met Gly Val Met Ala Met Leu Met 1 5	354
ctc ccc ctg ctg ctg gga atc agc ggc ctc ctc ttc att tac caa Leu Pro Leu Leu Leu Gly Ile Ser Gly Leu Leu Phe Ile Tyr Gln 10 15 20	402

gag Glu 25	gtg Val	tcc Ser	ag Ar	g c	tg t eu :	igg Frp 30	tca Ser	aag Lys	tca Ser	a go	ct o	gtg Val 35	cag Gln	aa As	c a n L	aa q ys V	gtg Val	٠ -	g 1 0	450
gtg Val	atc Ile	acc Thr	ga As	it g sp A	cc la 45	atc Ile	tca Ser	gga Gly	cto	1 G.	gc ly 50	aag Lys	gag Glu	tg Cy	t g	ct (cgg Arg 55	gt Va	g il	498
ttc Phe	cac His	aca Thi	c G1	gt g Ly G	gjà iga	gca Ala	agg Arg	ctg Leu	gto Val	ТГ	tg eu	tgt Cys	gga Gly	aa Ly	ig a 7s P	ac Asn 70	tgg Trp	ga G3	ag Lu	546
agg Arg	cta Leu	gad Gli 7	u As	ac (sn I	cta Leu	tat Tyr	gat Asp	gcc Ala 80	ье	g a u I	tc	agc Ser	gto Val	- A.	ct q La <i>l</i> 35	gac Asp	ccc Pro	a c	gc er	594
aag Lys	aca Thr	Ph	c a e Tl	cc (hr !	cca Pro	aag Lys	ctg Leu 95	gto Val	ct Le	g t	tg Leu	gac Asp	Lei 100	ى ر	ca (gac Asp	atc Ile	a S	gc er	642
tgt Cys 105	gto Val	cc Pr	a g o A	at sp	gtg Val	gca Ala 110	aaa Lys	gaa Glu	agt ıVa	c o	ctg Leu	gat Asp 115	, су	c t s T	at yr	ggc Gly	tgt Cys		tg al 20	690
gac Asp	ato Ile	c ct	c a u I	tc	aac Asn 125	aat Asn	gco Ala	a Se	t gt r Vá	ai i	aag Lys 130	gtç Val	g aa L Ly	g g s G	gg	cct Pro	gcc Ala 135		at Iis	738
aag Lys	at Il	t to e Se	er I	etg Leu L40	gag Glu	cto	gao Asp	c aa o Ly	s ri	ag ys 45	atc Ile	ato Me	g ga t As	t g p P	jcc Mla	aat Asn 150	* J -	c t	tt Phe	786
ggc Gly	c cc / Pr	o I	tc a le 1 55	aca Thr	ttg Leu	acq Thi	g aa c Ly	a gc s Al 16	a L	tg eu	ctt Leu	cc. Pr	c aa o As	511 F	atg 1et 165	ato	tc Se	c o	cgg Arg	834
aga Arg	a ac g Th 17	r G	gc (caa Gln	ato	gto Val	g tt l Le 17	a gt u Va 5	ga 11 A	at .sn	aat Asr	at n Il	e G.	aa 6 Ln 6 30	ggg Gly	aag Lys	g tt s Ph	t e	gga Gly	882
ato Ilo 18	e Pr	g t	tc he	cgt Arg	acq Thi	g ac Th 19	r Ty	c go	ct g La A	ıcc	tco Sei	c aa r Ly 19	s H	ac is	gca Ala	gco Ala	c ct a Le	·u	ggc Gly 200	930
tt Ph	c tt e Pl	t g ne A	ac sp	tgc Cys	cto Let 20	u Ar	a go g Al	c ga La Gi	aa g lu V	gtg /al	ga Gl 21	u Gi	a t Lu T	ac yr	gat Asp	gt:	t gt 1 Va 21		atc Ile	978
ag Se	c ac	cc q nr V	gtg /al	ago Ser 220	Pr	g ac o Th	t tt ir Pl	cc a ne I	Te v	egg Arg 225	tc Se	g ta r Ty	ac c yr H	ac is	gto Val	ta Ty 23		ca	gag Glu	1026
ca G1	aa g Ln G	ly A	aac Asn 235	tgg Trp	g ga o Gl	a go u Al	et to La S	er 1	tt le 40	tgg Trp	aa Ly	a t s P	tc t he E	tt he	Phe 24	s Ar	g a	ag ys	ctg Leu	1074
a c Ti	nr T	ac yr 50	ggc Gly	gto Va	g ca l Hi	s P	ro V	ta g al G 55	gag Slu	gtg Val	g gc	g g La G	Iu (gag Glu 260	gt: Va	g at 1 Me	g c et A	gc .rg	acc Thr	1122

gtg cgg agg aag aag caa gag gtg ttt atg gcc aac ccc atc ccc aag 1170 Val Arg Arg Lys Lys Gln Glu Val Phe Met Ala Asn Pro Ile Pro Lys 265 270 280	
gcc gcc gtg tac gtc cgc acc ttc ttc ccg gag ttc ttt ttc gcc gtg 1218 Ala Ala Val Tyr Val Arg Thr Phe Phe Pro Glu Phe Phe Phe Ala Val 285 290 295	
gtg gcc tgt ggg gtg aag gag aag ctc aat gtc ccg gag gag ggg 1263 Val Ala Cys Gly Val Lys Glu Lys Leu Asn Val Pro Glu Gly 300 305	
taactgcagg aggccaaatg ggccacccct tggaaataaa ggtttttctg gcaaaaaaaa 1323	
aaaaaaaaa aaantttgcg gccgcaagct tattcccttt agggagggtt aatttt 1379	
<210> 5 <211> 311 <212> PRT <213> Homo sapiens	
<400> 5 Met Gly Val Met Ala Met Leu Met Leu Pro Leu Leu Leu Gly Ile 1 5 10 15	
Ser Gly Leu Leu Phe Ile Tyr Gln Glu Val Ser Arg Leu Trp Ser Lys 20 25 30	
Ser Ala Val Gln Asn Lys Val Val Ile Thr Asp Ala Ile Ser Gly 35 40 45	
Leu Gly Lys Glu Cys Ala Arg Val Phe His Thr Gly Gly Ala Arg Leu 50 55 60	
Val Leu Cys Gly Lys Asn Trp Glu Arg Leu Glu Asn Leu Tyr Asp Ala 65 70 75 80	
Leu Ile Ser Val Ala Asp Pro Ser Lys Thr Phe Thr Pro Lys Leu Val 85 90 95	
Leu Leu Asp Leu Ser Asp Ile Ser Cys Val Pro Asp Val Ala Lys Glu 100 105 110	
Val Leu Asp Cys Tyr Gly Cys Val Asp Ile Leu Ile Asn Asn Ala Ser 115 120 125	
Val Lys Val Lys Gly Pro Ala His Lys Ile Ser Leu Glu Leu Asp Lys 130 135	
Lys Ile Met Asp Ala Asn Tyr Phe Gly Pro Ile Thr Leu Thr Lys Ala 145 150 150	
Leu Leu Pro Asn Met Ile Ser Arg Arg Thr Gly Gln Ile Val Leu Val 165 170 175	
Asn Asn Ile Gln Gly Lys Phe Gly Ile Pro Phe Arg Thr Thr Tyr Ala 180 185 190	
Ala Ser Lys His Ala Ala Leu Gly Phe Phe Asp Cys Leu Arg Ala Glu 195 200 205	

210 215 220	
Arg Ser Tyr His Val Tyr Pro Glu Gln Gly Asn Trp Glu Ala Ser Ile 225 230 235 240	
Trp Lys Phe Phe Phe Arg Lys Leu Thr Tyr Gly Val His Pro Val Glu 245 250 255	
Val Ala Glu Glu Val Met Arg Thr Val Arg Arg Lys Lys Gln Glu Val 260 265 270	
Phe Met Ala Asn Pro Ile Pro Lys Ala Ala Val Tyr Val Arg Thr Phe 275 . 280 . 285	
Phe Pro Glu Phe Phe Ala Val Val Ala Cys Gly Val Lys Glu Lys 290 295 300	
Leu Asn Val Pro Glu Glu Gly 305 310	
<210> 6	
<211> 933 <212> DNA <213> Homo sapiens	
<220> <221> CDS <222> (1)(933)	
<400> 6 atg gga gtc atg gcc atg ctg atg ctc ccc ctg ctg ctg ctg gga atc Met Gly Val Met Ala Met Leu Met Leu Pro Leu Leu Leu Gly Ile 1 5 10	48
∸	
agc ggc ctc ctc ttc att tac caa gag gtg tcc agg ctg tgg tca aag Ser Gly Leu Leu Phe Ile Tyr Gln Glu Val Ser Arg Leu Trp Ser Lys 20 25 30	96
agc ggc ctc ctc ttc att tac caa gag gtg tcc agg ctg tgg tca aag Ser Gly Leu Leu Phe Ile Tyr Gln Glu Val Ser Arg Leu Trp Ser Lys	96
agc ggc ctc ctc ttc att tac caa gag gtg tcc agg ctg tgg tca aag Ser Gly Leu Leu Phe Ile Tyr Gln Glu Val Ser Arg Leu Trp Ser Lys 20 25 30 tca gct gtg cag aac aaa gtg gtg gtg atc acc gat gcc atc tca gga Ser Ala Val Gln Asn Lys Val Val Val Ile Thr Asp Ala Ile Ser Gly	
agc ggc ctc ctc ttc att tac caa gag gtg tcc agg ctg tgg tca aag Ser Gly Leu Leu Phe Ile Tyr Gln Glu Val Ser Arg Leu Trp Ser Lys 25 30 tca gct gtg cag aac aaa gtg gtg gtg atc acc gat gcc atc tca gga Ser Ala Val Gln Asn Lys Val Val Val Ile Thr Asp Ala Ile Ser Gly 40 45 ctg ggc aag gag tgt gct cgg gtg ttc cac aca ggt ggg gca agg ctg Leu Gly Lys Glu Cys Ala Arg Val Phe His Thr Gly Gly Ala Arg Leu 60	144
agc ggc ctc ctc ttc att tac caa gag gtg tcc agg ctg tgg tca aag Ser Gly Leu Leu Phe Ile Tyr Gln Glu Val Ser Arg Leu Trp Ser Lys 20 tca gct gtg cag aac aaa gtg gtg gtg atc acc gat gcc atc tca gga Ser Ala Val Gln Asn Lys Val Val Val Ile Thr Asp Ala Ile Ser Gly 40 ctg ggc aag gag tgt gct cgg gtg ttc cac aca ggt ggg gca agg ctg Leu Gly Lys Glu Cys Ala Arg Val Phe His Thr Gly Gly Ala Arg Leu 50 gtg ctg tgt gga aag aac tgg gag agg cta gag aac cta tat gat gcc Val Leu Cys Gly Lys Asn Trp Glu Arg Leu Glu Asn Leu Tyr Asp Ala	144

gtc ctg gat tgc Val Leu Asp Cys 115	tat ggc tgt Tyr Gly Cys	gtg gac atc Val Asp Ile 120	ctc atc aac aa Leu Ile Asn As 125	t gcc agt 384 n Ala Ser
gtg aag gtg aag Val Lys Val Lys 130	ggg cct gcc Gly Pro Ala 135	cat aag att His Lys Ile	tct ctg gag ct Ser Leu Glu Le 140	c gac aaa 432 eu Asp Lys
aag atc atg gat Lys Ile Met Asp 145	gcc aat tac Ala Asn Tyr 150	ttt ggc ccc Phe Gly Pro	c atc aca ttg ac o Ile Thr Leu Th 155	eg aaa gcc 480 nr Lys Ala 160
ctg ctt ccc aac Leu Leu Pro Asn	atg atc tcc Met Ile Ser 165	cgg aga ac Arg Arg Th 17	r Gra Gru rre v	tg tta gtg 528 al Leu Val 175
aat aat atc caa Asn Asn Ile Gln 180	Gly Lys Phe	gga atc cc Gly Ile Pr 185	o File Arg III x	ct tac gct 576 hr Tyr Ala 90
gcc tcc aag cac Ala Ser Lys His 195	gca gcc cto Ala Ala Lev	g ggc ttc tt 1 Gly Phe Ph 200	t gac tgc ctc c le Asp Cys Leu A 205	ga gcc gaa 624 rg Ala Glu
gtg gag gaa tac Val Glu Glu Tyr 210	gat gtt gte Asp Val Val 21	I lie Ser in	cc gtg agc ccg a nr Val Ser Pro T 220	ct ttc atc 672 Thr Phe Ile
cgg tcg tac cac Arg Ser Tyr His 225	gtg tat cc s Val Tyr Pr 230	a gag caa gg o Glu Gln Gl	ga aac tgg gaa g ly Asn Trp Glu <i>H</i> 235	gct tcc att 720 Ala Ser Ile 240
tgg aaa ttc ttt Trp Lys Phe Phe	t ttc agg aa e Phe Arg Ly 245	s Leu Thr T	ac ggc gtg cac o yr Gly Val His 1 50	cca gta gag 768 Pro Val Glu 255
gtg gcg gag ga Val Ala Glu Gl 26	u Val Met Ar	c acc gtg c g Thr Val A 265	gg agg aag aag rg Arg Lys Lys	caa gag gtg 816 Gln Glu Val 270
ttt atg gcc aa Phe Met Ala As 275	c ccc atc co n Pro Ile Pi	cc aag gcc g co Lys Ala A 280	cc gtg tac gtc la Val Tyr Val 285	cgc acc ttc 864 Arg Thr Phe
ttc ccg gag tt Phe Pro Glu Ph 290	ne Phe Phe A.	cc gtg gtg g la Val Val <i>F</i> 95	gcc tgt ggg gtg Ala Cys Gly Val 300	aag gag aag 912 Lys Glu Lys
ctc aat gtc cc Leu Asn Val Pr 305	eg gag gag g ro Glu Glu G 310	gg ly		933
<210> 7 <211> 1725 <212> DNA <213> Homo saj	piens			
<220> <221> CDS <222> (281)	(1387)			

<220> <221> misc_feature <222> (1)..(1725) <223> All occurrences of n = any nucleotide <400> 7 gagaaggagg agccagcgga aggacggtgt gcgggccggc cagccctgga cgaaagaaga 60 gggcccctcc aggccagtct gggcaccctg ggatagcggc tgcagccatc agcaggggca 120 gacggcaggt ggcctggttg ctgcagctcc caggatcagc tctgccctcc ccgcaaacgc 180 cagoctogto acogotocag ggoacotoca goagtaacag gtggttgcag caggtggcag 240 ccagcccctg gatgagccaa ggtctcttcc ccagccaggc atg gcc gac tct gca Met Ala Asp Ser Ala cag gcc cag aag ctg gtg tac ctg gtc aca ggg ggc tgt ggc ttc ctg 343 Gln Ala Gln Lys Leu Val Tyr Leu Val Thr Gly Gly Cys Gly Phe Leu gga gag cac gtg gtg cga atg ctg ctg cag cgg gag ccc cgg ctc ggg 391 Gly Glu His Val Val Arg Met Leu Leu Gln Arg Glu Pro Arg Leu Gly 25 gag ctg cgg gtc ttt gac caa cac ctg qqt ccc tqq ctq gag gag ctg 439 Glu Leu Arg Val Phe Asp Gln His Leu Gly Pro Trp Leu Glu Glu Leu 45 aag aca ggg cct gtg agg gtg act gcc atc cag ggg gac gtg acc cag 487 Lys Thr Gly Pro Val Arg Val Thr Ala Ile Gln Gly Asp Val Thr Gln 60 gcc cat gag gtg gca gca gct gtg gcc gga gcc cat gtg gtc atc cac 535 Ala His Glu Val Ala Ala Ala Val Ala Gly Ala His Val Val Ile His acg gct ggg ctg gta gac gtg ttt ggc agg gcc agt ccc aag acc atc 583 Thr Ala Gly Leu Val Asp Val Phe Gly Arg Ala Ser Pro Lys Thr Ile 90 95 cat gag gtc aac gtg cag ggt acc cgg aac gtg atc gag gct tgt gtg 631 His Glu Val Asn Val Gln Gly Thr Arg Asn Val Ile Glu Ala Cys Val cag acc gga aca cgg ttc ctg gtc tac acc agc agc atg gaa gtt gtg 679 Gln Thr Gly Thr Arg Phe Leu Val Tyr Thr Ser Ser Met Glu Val Val 120 . 125 ggg cct aac acc aaa ggt cac ccc ttc tac agg ggc aac gaa gac acc 727 Gly Pro Asn Thr Lys Gly His Pro Phe Tyr Arg Gly Asn Glu Asp Thr 135 140 cca tac gaa gca gtg cac agg cac ccc tat cct tgc agc aag qcc ctg 775 Pro Tyr Glu Ala Val His Arg His Pro Tyr Pro Cys Ser Lys Ala Leu 150 155 160 165

gcc gag tgg ctg gtc ctg gag gcc aac ggg agg aag gtc cgt ggg ggg 823 Ala Glu Trp Leu Val Leu Glu Ala Asn Gly Arg Lys Val Arg Gly Gly 170 175 180	
ctg ccc ctg gtg acg tgt gcc ctt cgt ccc acg ggc atc tac ggt gaa 871 Leu Pro Leu Val Thr Cys Ala Leu Arg Pro Thr Gly Ile Tyr Gly Glu 185 190 195	
ggc cac cag atc atg agg gac ttc tac cgc cag ggc ctg cgc ctg gga 919 Gly His Gln Ile Met Arg Asp Phe Tyr Arg Gln Gly Leu Arg Leu Gly 200 205	
ggt tgg ctc ttc cgg gcc atc ccg gcc tct gtg gag cat ggc cgg gtc 967 Gly Trp Leu Phe Arg Ala Ile Pro Ala Ser Val Glu His Gly Arg Val 215 220 225	
tat gtg ggc aat gtt gcc tgg atg cac gtg ctg gca gcc cgg gag ctg 1015 Tyr Val Gly Asn Val Ala Trp Met His Val Leu Ala Ala Arg Glu Leu 230 245	
gag cag cgg gca gcc ctg atg ggc ggc cag gta tac ttc tgc tac gat 1063 Glu Gln Arg Ala Ala Leu Met Gly Gly Gln Val Tyr Phe Cys Tyr Asp 250 255 260	
gga tca ccc tac agg agc tac gag gat ttc aac atg gag ttc ctg ggc 1111 Gly Ser Pro Tyr Arg Ser Tyr Glu Asp Phe Asn Met Glu Phe Leu Gly 265 270 275	
ccc tgc gga ctg cgg ctg ggc gcc cgc cca ttg ctg ccc tac tgg 1159 Pro Cys Gly Leu Arg Leu Val Gly Ala Arg Pro Leu Leu Pro Tyr Trp 280 285 290)
ctg ctg gtg ttc ctg gct gcc ctc aat gcc ctg ctg cag tgg ctg ctg 1207 Leu Leu Val Phe Leu Ala Ala Leu Asn Ala Leu Leu Gln Trp Leu Leu 295 300 305	7
cgg cca ctg gtg ctc tac gca ccc ctg ctg aac ccc tac acg ctg gcc 1255 Arg Pro Leu Val Leu Tyr Ala Pro Leu Leu Asn Pro Tyr Thr Leu Ala 310 315 320 325	ō
gtg gcc aac acc acc ttc acc gtc agc acc gac aag gct cag cgc cat 130: Val Ala Asn Thr Thr Phe Thr Val Ser Thr Asp Lys Ala Gln Arg His 330 335 340	3
ttc ggc tat gag ccc ctg ttc tcg tgg gag gat agc cgg acc cgc acc Phe Gly Tyr Glu Pro Leu Phe Ser Trp Glu Asp Ser Arg Thr Arg Thr 345 350 355	1
att ctc tgg gta cag gcc gct acg ggt tca gcc cag tgacggtggg 139 Ile Leu Trp Val Gln Ala Ala Thr Gly Ser Ala Gln 360 365	17
gctggggcct ggaggcccag atacagcaca tccacccagg tcccgagccc tcacaccctg 145	57
gacgggaagg gacagctgca ttccagagca ggaggcaggg ctctggggcc agaatggctg 151	
teettgtegt agageeetee acattttett tttettttt gagacagggt ettgetetgt 157	
cacccagact ggaatgcaag tggtgtgant cataagctca ctngmaccct yaanccttct 163	
gggttcaagc aatcettnet ngeetyaane ettetngaac aagettggga necacaggtg 16	97

cacgccance acaneetgge ttttttt

1725

<210> 8

<211> 369

<212> PRT

<213> Homo sapiens

<400> 8

Met Ala Asp Ser Ala Gln Ala Gln Lys Leu Val Tyr Leu Val Thr Gly

Gly Cys Gly Phe Leu Gly Glu His Val Val Arg Met Leu Leu Gln Arg

Glu Pro Arg Leu Gly Glu Leu Arg Val Phe Asp Gln His Leu Gly Pro

Trp Leu Glu Glu Leu Lys Thr Gly Pro Val Arg Val Thr Ala Ile Gln

Gly Asp Val Thr Gln Ala His Glu Val Ala Ala Ala Val Ala Gly Ala

His Val Val Ile His Thr Ala Gly Leu Val Asp Val Phe Gly Arg Ala

Ser Pro Lys Thr Ile His Glu Val Asn Val Gln Gly Thr Arg Asn Val 105

Ile Glu Ala Cys Val Gln Thr Gly Thr Arg Phe Leu Val Tyr Thr Ser 120

Ser Met Glu Val Val Gly Pro Asn Thr Lys Gly His Pro Phe Tyr Arg 135

Gly Asn Glu Asp Thr Pro Tyr Glu Ala Val His Arg His Pro Tyr Pro 160

Cys Ser Lys Ala Leu Ala Glu Trp Leu Val Leu Glu Ala Asn Gly Arg 170 165

Lys Val Arg Gly Gly Leu Pro Leu Val Thr Cys Ala Leu Arg Pro Thr

Gly Ile Tyr Gly Glu Gly His Gln Ile Met Arg Asp Phe Tyr Arg Gln 200

Gly Leu Arg Leu Gly Gly Trp Leu Phe Arg Ala Ile Pro Ala Ser Val 210

Glu His Gly Arg Val Tyr Val Gly Asn Val Ala Trp Met His Val Leu 235

Ala Ala Arg Glu Leu Glu Gln Arg Ala Ala Leu Met Gly Gly Gln Val

Tyr Phe Cys Tyr Asp Gly Ser Pro Tyr Arg Ser Tyr Glu Asp Phe Asn 265 260

Met	Glu	Ph 27		eu	Gly	Pro	Cys	G1 28	y L∈ O	eu <i>F</i>	Arg	Leu	. Va	1 6	Sly 285	Ala	Ar	g P	ro		
Leu	Leu 290		0 Т	yr	Trp	Leu	Leu 295	va 5	1 Pl	he I	Leu	Ala	A1 30	.a I	Leu	Asn	Al	a I	eu	٠	
Leu 305	Gln	Tr	p L	eu	Leu	Arg 310	Pro	Le	eu V	al I	Leu	Ту: 315	A]	la 1	Pro	Leu	L€	eu <i>F</i>	Asn 320		
Pro	Tyr	Th	ır L	eu	Ala 325	Val	Ala	a As	sn T	hr '	Thr 330	Phe	e Ti	nr '	Val	Ser	Th 30	nr <i>1</i> 35	Asp		
Lys	Ala	a Gl		Arg 840	His	Phe	e Gl	у Ту	yr G 3	lu 145	Pro	Le	u Pl	he	Ser	Trp 350	o G:	lu A	Asp		
Ser	Ar		nr <i>F</i> 55	٩rg	Thr	Ile	e Le	u T:	rp V 60	al	Gln	Al	a A	la	Thr 365	Gly	y S	er 2	Ala		
Gln																					
<21 <21 <21 <22 <22	20> 21>	110 DNA Hom	.o s		ens																
<22	22>	(1)	(110)7)																
ato Me	00> g gc t Al		jac Asp	tct Sei	gc Al	a ca a Gl	ig go .n Al	cc (la (cag Gln	aag L:ys	Lе	g g u V	tg '	tac Tyr	cto	g gt u Va	c al '	aca Thr 15	gg(Gl	y Y	48
		gt (ys (ggc Gly	tte Phe	e Le	g gg u G	ga g Ly G	ag (lu 1	cac His	gtg Val 25	. va	g c l A	ga rg	atg Met	ct Le	u "	tg eu 30	cag Gln	cg Ar	a a	96
ga Gl	g c	cc ro	cgg Arg 35	ct Le	c gg u Gl	ıg ge	ag c lu L	tg eu	cgg Arg 40	gto Val	c tt L Ph	t g ne A	ac	caa Glr	1 111	c c s L 5	tg eu	ggt Gly	cc Pr	с 0	144
tç Tr	ib r	tg eu 50	gag Glu	ga Gl	g ct u Le	g a eu L	ag a ys T	ca hr 55	ggg Gly	cct Pro	t gt o Va	ig a	igg Arg	gto Val		t g r A	cc la	ato	ca Gl	g .n	192
G:	gg 9 ly <i>P</i> 65	ac	gtg Val	ac Th	c c ir G	ag g ln A	cc o la H	cat lis	gag Glu	gt. Va	g g	ca d la <i>l</i>	gca Ala 75	gc:	t gt a Va	g g	cc la	gga Gly	7	cc La 30	240
H	at q is V	gtg /al	gto Val	at I	le H	ac a is T 85	ncg (gct Ala	G1 y	ct Le	g g u V	ta 6 al . 90	gac Asp	gt Va	g ti 1 Pi	tt q	ggc	age Are	9	cc la	288
: a S	gt d er !	ccc Pro	aaq Lys	5 T	cc a hr I 00	tc d le l	cat His	gag Glu	gto Val	aa L As	in v	tg al	cag Gln	gg Gl	t a y T	111. 1	cgg Arg 110		c g n V	tg al	336

atc (gag Glu	gct Ala 115	tgt Cys	gtg Val	cag Gln	acc Thr	gga Gly 120	aca Thr	cg Ar	gg t cg F	tc he	ctg Leu	gto Val 125	L 1	ac a yr T	cc hr	ago Sei	_	384
agc a	atg Met 130	gaa Glu	gtt Val	gtg Val	Gly ggg	cct Pro 135	aac Asn	acc Thr	aa Ly	aa g ys C	ggt Gly	cac His 140	Pro	c to	tc t he S	cac Tyr	ago Aro	a a	432
ggc Gly 145	aac Asn	gaa Glu	gac Asp	acc Thr	cca Pro 150	tac Tyr	gaa Glu	gca Ala	agt aVa	aı ı	cac His 155	agg Arg	ca Hi	c c s P	cc ' ro '	tat Tyr	cc Pr 16	•	480
tgc Cys	agc Ser	aag Lys	gcc Ala	ctg Leu 165	gcc Ala	gag Glu	tgg Trp	cto Le	۷.	tc al 70	ctg Leu	gag Glu	gc Al	ca aA	1211	ggg Gly 175	ag Ar	.d	528
aag Lys	gtc Val	cgt Arg	ggg Gly 180	ggg	ctg Leu	ccc Pro	ctg Leu	gto Va 18	1 T	cg hr	tgt Cys	gco	c ct a Le	ur	gt Arg L90	ccc Pro	ac Th	g ir	576
ggc Gly	atc Ile	tac Tyr 195	Gly	gaa Glu	ggc Gly	cac His	Glr 200	TT	c a e M	atg Met	agg Arg	gad	e tt p Ph 20	16 .	cac Tyr	cgc Arg	G3	ag Ln	624
ggc Gly	ctg Leu 210	Arg	c cto g Lei	g gga ı Gly	a ggt 7 Gly	tgg Trp 215) Lei	c tt u Ph	с с .e <i>F</i>	cgg Arg	gcc Ala	at 11 22	e F1	eg (ro i	gcc Ala	tct Ser	gt Vä	tg al	672
gag Glu 225	His	ggo Gl	c cgg	g gto g Val	c tat L Typ 230	· Val	g gge L Gl	c aa y As	it q	gtt Val	gcc Ala 235	1 1 L	ga pM	tg et	cac His	gtg Val		tg eu 40	720
gca Ala	gco	c cg	g ga g Gl	g cto u Le	u Gl	g cad u Gl:	g cg n Ar	g go g Al	La .	gcc Ala 250	cto Lev	g at u Me	g g t G	gc ly	ggc Gly	caç Glr 255		ta al	768
tac Tyr	tto Pho	c tg e Cy	c ta s Ty 26	c ga r As O	t gg p Gl	a tc y Se	a cc r Pr	O T	ac yr 65	agg Arg	age Se	c ta r Ty	ıc g /r G	ag lu	gat Asp 270	LII	ca eA	ac sn	816
atç Met	g ga : Gl	g tt u Ph 27	e Le	g gg u Gl	y Pr	о Су	c gg s Gl 28	у Г	eu	Arg	ге	u v	11 (gc Sly 285	gcc	cg Ar	g E	cca Pro	864
ttç Lei	g ct u Le 29	u Pr	c ta o Ty	ec to	g ct	g ct u Le 29	eu Va	g t	tc he	ctç	g gc ı Al	a A	cc o la 1 00	ctc Leu	aat Asr	gc n Al	c o	ctg Leu	912
cto Le	u Gl	ig to .n Ti	gg ct cp Le	ig ct eu Le	eu Ai	gg co ng Pi 10	ca ct	tg g eu V	tg al	cto Lev	ta u Ty 31	/I A	ca (la :	ccc Pro	ct (g ct u Le	•	aac Asn 320	960
cc Pr	c ta	ac a yr Ti	cg c hr L	tg go eu Ai 31	cc gi la Va 25	ig go	cc a la A	ac a sn 1	icc Thr	ace Th:	r Pi	c a	cc	gtc Val	ag Se	c ac r Th 33		gac Asp	1008
aa Ly	ıg go vs A	ct c la G	ln A	gc c rg H 40	at t	tc g he G	gc t ly T	yr (gag Glu 345	Pr	c c	tg t eu E	tc he	tcg Ser	tg Tr 35	P 0-	ag Lu	gat Asp	1056

agc cgg acc cgc acc att ctc tgg gta cag gcc gct acg ggt tca gcc Ser Arg Thr Arg Thr Ile Leu Trp Val Gln Ala Ala Thr Gly Ser Ala 355 360 365	1104
cag Gln	1107
<210> 10 <211> 1209 <212> DNA <213> Homo sapiens	
<220> <221> CDS <222> (61)(1026)	
<400> 10 cccacgcgtc cgcccacgcg tccgcggacg cgtgggcgga cgcgtgggcg cccgcctc	ga 60
atg tcc ctg aga ccc aga agg gcc tgc gct cag ctg ctc tgg cac ccc Met Ser Leu Arg Pro Arg Arg Ala Cys Ala Gln Leu Leu Trp His Pro 1 5 10 15	108
gct gca ggg atg gcc tcc tgg gct aag ggc agg agc tac ctg gcg cc Ala Ala Gly Met Ala Ser Trp Ala Lys Gly Arg Ser Tyr Leu Ala Pro 20 25 30	z 156 o
ggt ttg ctg cag ggc caa gtg gcc atc_gtc acc ggc ggg gcc acg gg Gly Leu Leu Gln Gly Gln Val Ala Ile Val Thr Gly Gly Ala Thr Gl 35 40	c 204 Y
atc gga aaa gcc atc gtg aag gag ctc ctg gag ctg ggg agt aat gt Ile Gly Lys Ala Ile Val Lys Glu Leu Leu Glu Leu Gly Ser Asn Va 50 60	g 252 1
gtc att gca tcc cgt aag ttg gag aga ttg aag tct gcg gca gat ga Val Ile Ala Ser Arg Lys Leu Glu Arg Leu Lys Ser Ala Ala Asp Gl 65 70 75	a 300 .u 80
ctg cag gcc aac cta cct ccc aca aag cag gca cga gtc att ccc at Leu Gln Ala Asn Leu Pro Pro Thr Lys Gln Ala Arg Val Ile Pro I 85	a 348 Le
caa tgc aac atc cgg aat gag gag gtg aat aat ttg gtc aaa t Gln Cys Asn Ile Arg Asn Glu Glu Glu Val Asn Asn Leu Val Lys S 100 105 110	ct 396 er
acc tta gat act ttt ggt aag atc aat ttc ttg gtg aac aat gga g Thr Leu Asp Thr Phe Gly Lys Ile Asn Phe Leu Val Asn Asn Gly G 115 120 125	ga 444 ly
ggc cag ttt ctt tcc cct gct gaa cac atc agt tct aag gga tgg c Gly Gln Phe Leu Ser Pro Ala Glu His Ile Ser Ser Lys Gly Trp H 130 135 140 :	ac 492 is
gct gtg ctt gag acc aac ctg acg ggt acc ttc tac atg tgc aaa g Ala Val Leu Glu Thr Asn Leu Thr Gly Thr Phe Tyr Met Cys Lys <i>I</i> 145 150 155	gca 540 Ala -60

gtt tac a Val Tyr S	igc tcc Ser Ser	tgg Trp 165	atg Met	aaa Lys	gag Glu	cat His	gga Gly 170	gga Gly	tct Ser	atc Ile	gtc Val	aat Asn 175		588
att gtc c	cct act Pro Thr 180	aaa Lys	gct Ala	gga Gly	ttt Phe	cca Pro 185	tta Leu	gct Ala	gtg _. Val	cat His	tct Ser 190	gga Gly	gct Ala	636
gca aga g Ala Arg <i>A</i>	gca ggt Ala Gly 195	gtt Val	tac Tyr	aac Asn	ctc Leu 200	acc Thr	aaa Lys	tct Ser	tta Leu	gct Ala 205	ttg Leu	gaa Glu	tgg Trp	684
gcc tgc a Ala Cys S 210	agt gga Ser Gl <u>y</u>	ata Ile	cgg Arg	atc Ile 215	aat Asn	tgt Cys	gtt Val	gcc Ala	cct Pro 220	gga Gly	gtt Val	att Ile	tat Tyr	732
tcc cag a Ser Gln 1 225	act gct Thr Ala	gtg Val	gag Glu 230	aac Asn	tat Tyr	ggt Gly	tcc Ser	tgg Trp 235	gga Gly	caa Gln	agc Ser	ttc Phe	ttt Phe 240	780
gaa ggg Glu Gly	tct ttt Ser Phe	cag Gln 245	aaa Lys	atc Ile	ccc Pro	gct Ala	aaa Lys 250	cga Arg	att Ile	ggt Gly	gtt Val	cct Pro 255	GIU	828
gag gtc Glu Val	tcc tc Ser Se 26	r Val	gtc Val	tgc Cys	ttc Phe	cta Leu 265	Leu	tct Ser	cct Pro	gca Ala	gct Ala 270	JUL	ttc Phe	876
atc act Ile Thr	gga ca Gly Gl 275	g tcg n Ser	gtg Val	gat Asp	gtg Val 280	. Asp	ggg Gly	ggc Gly	cgg Arg	agt Ser 285	. Let	tat Tyr	act Thr	924
cac tcg His Ser 290	tat ga Tyr Gl	g gta u Val	a cca L Pro	a gat Asp 295	His	gac S Asp	aac Asr	tgg Tr	g ccc Pro 300	о гА:	g gga s Gly	a gca y Ala	a ggg a Gly	972
gac ctt Asp Leu 305	tct gt Ser Va	t gto	c aaa l Lys 310	s Ly:	g ato	g aaq t. Lys	g gaq s Glu	g acc i Th: 31	r Le	a aad u Ly:	g gad s Glu	g aaa u Ly:	a gct s Ala 320	1020
aag ctc Lys Leu		gagg	aaa	caag	gtg	tcct	ccat	cc c	cagt	gcct	t ca	catc	ttga	1076
ggatatg	ctt ct	gtact	ttt	taaa	agct	ta t	agtt	ggta	t gg	aaaa	catt	ttt	cttatt	t 1136
ttaagtg	itta tta	aatta	tat	ctat	ggaa	aa a	ctat	tcct	g aa	atat	atac	agt	cttatg	t 1196
cccaaaa	iaaa aa	a												1209

<210> 11

<211> 322

<212> PRT

<213> Homo sapiens

<400> 11

Met Ser Leu Arg Pro Arg Ala Cys Ala Gln Leu Leu Trp His Pro

Ala Ala Gly Met Ala Ser Trp Ala Lys Gly Arg Ser Tyr Leu Ala Pro 25

and the second s

- Gly Leu Leu Gln Gly Gln Val Ala Ile Val Thr Gly Gly Ala Thr Gly 35 40 45
- Ile Gly Lys Ala Ile Val Lys Glu Leu Glu Leu Gly Ser Asn Val 50 55 60
- Val Ile Ala Ser Arg Lys Leu Glu Arg Leu Lys Ser Ala Ala Asp Glu 65 70 75 80
- Leu Gln Ala Asn Leu Pro Pro Thr Lys Gln Ala Arg Val Ile Pro Ile 85 90 95
- Gln Cys Asn Ile Arg Asn Glu Glu Glu Val Asn Asn Leu Val Lys Ser 100 105 110
- Thr Leu Asp Thr Phe Gly Lys Ile Asn Phe Leu Val Asn Asn Gly Gly 115 120
- Gly Gln Phe Leu Ser Pro Ala Glu His Ile Ser Ser Lys Gly Trp His 130 135 140
- Ala Val Leu Glu Thr Asn Leu Thr Gly Thr Phe Tyr Met Cys Lys Ala 145 150 155 160
- Val Tyr Ser Ser Trp Met Lys Glu His Gly Gly Ser Ile Val Asn Ile 165 170 175
- Ile Val Pro Thr Lys Ala Gly Phe Pro Leu Ala Val His Ser Gly Ala 180 185 190
- Ala Arg Ala Gly Val Tyr Asn Leu Thr Lys Ser Leu Ala Leu Glu Trp 195 200 · 205
- Ala Cys Ser Gly Ile Arg Ile Asn Cys Val Ala Pro Gly Val Ile Tyr 210 215 220
- Ser Gln Thr Ala Val Glu Asn Tyr Gly Ser Trp Gly Gln Ser Phe Phe 225 230 235 240
- Glu Gly Ser Phe Gln Lys Ile Pro Ala Lys Arg Ile Gly Val Pro Glu 245 250 250
- Glu Val Ser Ser Val Val Cys Phe Leu Leu Ser Pro Ala Ala Ser Phe 260 265 270
- Ile Thr Gly Gln Ser Val Asp Val Asp Gly Gly Arg Ser Leu Tyr Thr 275 280 285
- His Ser Tyr Glu Val Pro Asp His Asp Asn Trp Pro Lys Gly Ala Gly 290 295 300
- Asp Leu Ser Val Val Lys Lys Met Lys Glu Thr Leu Lys Glu Lys Ala 305 310 315 320

Lys Leu

<210> 12 <211> 966 <212> DNA <213> Homo sapiens		
<220> <221> CDS <222> (1)(966)		
<400> 12 atg tcc ctg aga ccc aga agg gcc tgc gc Met Ser Leu Arg Pro Arg Arg Ala Cys Al 1 5	d GIN hed hed rip mis in	
gct gca ggg atg gcc tcc tgg gct aag gg Ala Ala Gly Met Ala Ser Trp Ala Lys Gl 20	c agg agc tac ctg gcg cct 96 y Arg Ser Tyr Leu Ala Pro 30	
ggt ttg ctg cag ggc caa gtg gcc atc gt Gly Leu Leu Gln Gly Gln Val Ala Ile Va 35 40	c acc ggc ggg gcc acg ggc 14 al Thr Gly Gly Ala Thr Gly 45	4
atc gga aaa gcc atc gtg aag gag ctc ct Ile Gly Lys Ala Ile Val Lys Glu Leu Le 50	ng gag ctg ggg agt aat gtg 19 Heu Glu Leu Gly Ser Asn Val 60	2
gtc att gca tcc cgt aag ttg gag aga tt Val Ile Ala Ser Arg Lys Leu Glu Arg Le 65	tg aag tct gcg gca gat gaa 24 eu Lys Ser Ala Ala Asp Glu 75 80	10
ctg cag gcc aac cta cct ccc aca aag c Leu Gln Ala Asn Leu Pro Pro Thr Lys G	ag gca cga gtc att ccc ata 28 ln Ala Arg Val Ile Pro Ile 90 95	38
caa tgc aac atc cgg aat gag gag g Gln Cys Asn Ile Arg Asn Glu Glu V 100 105	ty dat dat try goo and the	36
acc tta gat act ttt ggt aag atc aat t Thr Leu Asp Thr Phe Gly Lys Ile Asn P 115	it tig gra ado ado ga aga	84
ggc cag ttt ctt tcc cct gct gaa cac a Gly Gln Phe Leu Ser Pro Ala Glu His I 130	atc agt tct aag gga tgg cac 4 Tle Ser Ser Lys Gly Trp His 140	32
gct gtg ctt gag acc aac ctg acg ggt a Ala Val Leu Glu Thr Asn Leu Thr Gly 1 145	acc acg ege and gen	180
gtt tac agc tcc tgg atg aaa gag cat o Val Tyr Ser Ser Trp Met Lys Glu His o 165	gga gga tct atc gtc aat atc 5 Gly Gly Ser Ile Val Asn Ile 170 175	528
att gtc cct act aaa gct gga ttt cca Ile Val Pro Thr Lys Ala Gly Phe Pro 180 185	tta qui gig cat cet gga g-	576
gca aga gca ggt gtt tac aac ctc acc Ala Arg Ala Gly Val Tyr Asn Leu Thr 195 200	aaa tct tta gct ttg gaa tgg Lys Ser Leu Ala Leu Glu Trp 205	624

gcc t Ala C	gc Cys 210	agt Ser	gga Gly	ata Ile	cgg Arg	atc Ile 215	aat Asn	tgt Cys	gtt Val	gcc Ala	cct Pro 220	gga Gly	gtt Val	att Ile	tat Tyr	672
tcc (Ser (cag Gln	act Thr	gct Ala	gtg Val	gag Glu 230	aac Asn	tat Tyr	ggt Gly	tcc Ser	tgg Trp 235	gga Gly	caa Gln	agc Ser	ttc Phe	ttt Phe 240	720
gaa (Glu (Gly	Ser	Phe	Gln 245	Lys	iie	PIO	Ala	250	Arg	110	017		255		768
gag Glu	gtc Val	tcc Ser	tct Ser 260	Val	gtc Val	tgc Cys	ttc Phe	cta Leu 265	ctg Leu	tct Ser	cct Pro	gca Ala	gct Ala 270	tcc Ser	ttc Phe	816
atc Ile	act Thr	gga Gly 275	Gln	tcg Ser	gtg Val	gat Asp	gtg Val 280	Asp	Gly	ggc Gly	cgg Arg	agt Ser 285		tat	act Thr	864
cac His	tcg Ser 290	Ту	gaç Glu	gta Val	cca Pro	gat Asp 295	HIS	gac Asp	aac Asr	tgg Trp	ccc Pro 300		gga Gly	gca Ala	a ggg a Gly	912
gac Asp 305	ct t Le	tc 1 Se	t gti r Val	gto L Vai	c aaa L Lys 310	з ГА	g ato	g aaq t Lys	g gaq s Glu	g acc 1 Thi 315	. 1100	aaq Lys	g gaq s Glu	g aaa u Ly:	a gct s Ala 320	960
aag					-									•		966
Lys	Le	u									•					
<21 <21	.0> .1> .2> .3>	303 PRT	us n	orve	gicu	s										
Met	00> : G1 L	13 .y Se	er Tr	тр Ьу	rs Se 5	er Gl	y Gl	ln Se	r Ty	r Le	eu Al	a Al	a Gl	y Le	eu Leu 15	. •
C1,									١	.0						
GII	n As	sn G		al Al 20	La Va	al Vā	al Th	nr Gl		.0		ır Gl	y II	Le GI 30	ly Lys	;
Ala	a I	le S	er A: 35	20 rg Gi	lu L€	eu Le	eu H	is Le 40	.y GI 25 eu Gi	ly Al ly C	la Th	sn Va	al Va 45	al I	le Ala	a
Ala	a II	le S	er A: 35	20 rg Gi	lu L€	eu Le	eu H	is Le 40	.y GI 25 eu Gi	ly Al ly C	la Th ys As al As	sn Va	al Va 45	al I		a
Ala Se Se 6	a II r A	le S rg L 50 ln F	er A: 35 ys L	20 rg G eu A ro S	lu Le sp A er S	eu Le rg L er S 70	eu H eu T 55 er T	is Le 40 hr A hr G	Jy Gl 25 eu G la A	ly Al ly Cy la V	ys As al As hr A	sn Va sp G 60	al Va 45 lu L	al I eu A ln C	le Ala rg Ala ys As	n O
Ala Se Se 6	a II r A	le S rg L 50 ln F	er A: 35 ys L	20 rg G eu A ro S	lu Le sp A er S	eu Le rg L er S 70	eu H eu T 55 er T	is Le 40 hr A hr G	Jy Gl 25 eu G la A	ly Al ly Cy la V	ys As al As hr A	sn Va sp G 60	al Va 45 lu L	al I eu A ln C	le Ala	n O

Met Ala Pro Ala Glu Asp Ile Thr Ala Lys Gly Trp Gln Ala Val Ile 120

Glu Thr Asn Leu Thr Gly Thr Phe Tyr Met Cys Lys Ala Val Tyr Asn 135

Ser Trp Met Lys Asp His Gly Gly Ser Ile Val Asn Ile Ile Val Leu

Leu Asn Asn Gly Phe Pro Thr Ala Ala His Ser Gly Ala Ala Arg Ala

Gly Val Tyr Asn Leu Thr Lys Thr Met Ala Leu Thr Trp Ala Ser Ser 185

Gly Val Arg Ile Asn Cys Val Ala Pro Gly Thr Ile Tyr Ser Gln Thr 200

Ala Val Asp Asn Tyr Gly Glu Leu Gly Gln Thr Met Phe Glu Met Ala 215

Phe Glu Asn Ile Pro Ala Lys Arg Val Gly Leu Pro Glu Glu Ile Ser 235 230

Pro Leu Val Cys Phe Leu Leu Ser Pro Ala Ala Ser Phe Ile Thr Gly 245

Gln Leu Ile Asn Val Asp Gly Gln Ala Leu Tyr Thr Arg Asn Phe

Thr Ile Pro Asp His Asp Asn Trp Pro Val Gly Ala Gly Asp Ser Ser 280 275

Phe Ile Lys Lys Val Lys Glu Ser Leu Lys Lys Gln Ala Arg Leu 300

<210> 14

<211> 1108

<212> DNA

<213> Mus musculus

<220>

<221> CDS

<222> (102)..(1034)

<400> 14

ggaatggatg ctgttggctt aaacctcccc ctgccctggg ggttgcaacc agggtctctg 60

caaagccaat cetttgteat eeegetgtee tgeagageaa g atg ggg ete atg get 116 Met Gly Leu Met Ala

gtc ctg atg cta ccc ctg ctg ctg ctg gga atc agc ggc ctc ctc ttc 164 Val Leu Met Leu Pro Leu Leu Leu Gly Ile Ser Gly Leu Leu Phe 15 10

att tac cag gag gca tcc agg ctg tgg tcg aag tct gcc gtg cag aac 212 Ile Tyr Gln Glu Ala Ser Arg Leu Trp Ser Lys Ser Ala Val Gln Asn 30 25

aaa gtg gt Lys Val Va 4	l Val Ile	c aca gat e Thr Asp	gcc a Ala I 45	itc tc :le Se	a gga er Gly	ctg gga Leu Gly 50	aag ga Lys Gl	g tgt u Cys	260
gct cgg gt Ala Arg Va 55	g ttc cat l Phe Hi	t gca ggt s Ala Gly 60	GIY P	gca ag Ala Ar	gg ctg cg Leu	gtg ctg Val Leu 65	tgt gg Cys Gl	ga aag Ly Lys	308
aac tgg ga Asn Trp Gl 70	g gga ct u Gly Le	g gag ago u Glu Sei 75	ctc t	tat go Tyr Al	cc acc la Thr 80	ttg acc Leu Thr	agt gt Ser Va	g gct al Ala 85	356
gac ccc ac Asp Pro Se	er Lys Th	a ttc aco r Phe Th 0	c ccc a	Lys Le	tg gtc eu Val 95	ctc ctc Leu Leu	r wash re	tc tca eu Ser 00	404
gac att ac Asp Ile Se	gc tgt gt er Cys Va 105	t caa ga 1 Gln As	p Val A	gcc a Ala L 110	aa gag ys Glu	gtc cto	gac to Asp C 115	gc tac ys Tyr	452
ggc tgt g Gly Cys V 1	tg gac at al Asp Il 20	c ctc at e Leu Il	c aac e Asn 125	aat g Asn A	cc agc la Ser	gtg aaa Val Ly: 13	s Agr n	ag ggg ys Gly	500
cct gcc c Pro Ala H 135	ac aag at is Lys I:	t tcc ct le Ser Le 14	u Glu	ctt g Leu A	ac aaa sp Lys	aag at Lys Il 145	c atg g e Met A	at gcc Asp Ala	548
aac tac t Asn Tyr P 150	tc gga co he Gly P	cc atc ac ro Ile Th 155	t tta ir Leu	acc a Thr I	aaa gtt Lys Val 160	L Leu Le	t ccc a u Pro <i>P</i>	aac atg Asn Met 165	596
atc tcc a Ile Ser A	rg Arg T	ca ggc ca hr Gly Gi 70	ng att In Ile	Val 1	tta gto Leu Val 175	g aac aa L Asn As	n rre	caa gcg Gln Ala 180	644
aag ttt (Lys Phe (gga atc c Gly Ile P 185	cg ttc co ro Phe A	gc aca rg Thr	gct t Ala 1 190	tat gca Tyr Ala	a gcc to a Ala Se	et aag e er Lys 1 195	cat gcc His Ala	692
gtc atg (Val Met (ggc ttc t Gly Phe E 200	tt gac t Phe Asp C	gc ctc ys Leu 205	Arg	gcc ga Ala Gl	u vai 6	ag gaa Lu Glu 10	tac gat Tyr Asp	740
gtt gtg Val Val 215	gtc agc a Val Ser 1	Thr Val S	gc cca er Pro 20	act Thr	ttc at Phe Il	c cgc to e Arg So 225	er Tyr	cgt gct Arg Ala	788
tcc cct Ser Pro 230	gag caa a Glu Gln <i>i</i>	aga aac t Arg Asn 1 235	gg gag rp Glu	g aca n Thr	tcc at Ser Il 24	.e Суз ь	aa ttc ys Phe	ttc tgc Phe Cys 245	836
Arg Lys	Leu Ala	tat ggc q Tyr Gly \ 250	al His	s Pro	255	ıu var A	ia Giu	260	884
atg cgc Met Arg	aca gta Thr Val 265	cgg agg a Arg Arg 1	aag aaq Lys Lys	g caa s Gln 270	gag gt Glu Va	tg ttc a al Phe M	tg gcc let Ala 275	aac ccg Asn Pro	932

gtt o Val E	Pro I	ys A 280	la A	la V	al P	he 1 2	1e <i>P</i> 85	arg T	hr E	ne r	ne P	90 90	iu P	ne r	iie	980
ttc q Phe A	gct g Ala V 295	gtg g /al V	jtg g Val A	icc t la C	ys G	igg g	tg a al I	ag g .ys G	jag a Slu I	ıys ı	etc a Leu A 305	at g sn V	tc c al F	ca g ro G	aa Slu	1028
gag (Glu (310		taaco	ctcgt	g go	caaa	ıgggg	j tca	actca	aagg	ggaa	ataaa	gg c	tttc	ctag	ja	1084
gaaa	aaaa	aa aa	aaaa	aaaaa	a aaa	aa										1108
	> 31 > PR	1	scul	us												
<400 Met 1	> 15 Gly	Leu	Met	Ala 5	Val :	Leu	Met	Leu	Pro 10	Leu	Leu l	Leu I	Leu	Gly 15	Ile	
Ser	Gly	Leu	Leu 20	Phe	Ile	Tyr	Gln	Glu 25	Ala	Ser	Arg :	Leu '	Trp 30	Ser	Lys	
Ser	Ala	Val 35	Gln	Asn	Lys	Val	Val 40	Val	Ile	Thr	Asp .	Ala 45	Ile	Ser	Gly	
Leu	Gly 50	Lys	Glu	Cys	Ala	Arg 55	Val	Phe	His	Ala	Gly 60	Gly .	Ala	Arg	Leu	
Val 65	Leu	Cys	Gly	Lys	Asn 70	Trp	Glu	Gly	Leu	Glu 75	Ser	Leu	Tyr	Ala	Thr 80	
Leu	Thr	Ser	Val	Ala 85	Asp	Pro	Ser	Lys	Thr 90	Phe	Thr	Pro	Lys	Leu 95	Val	
Leu	Leu	Asp	Leu 100	Ser	Asp	Ile	Ser	Cys 105	Val	Gln	Asp	Val	Ala 110	Lys	Glu	
Val	Leu	Asp 115	Суз	Tyr	Gly	Суѕ	Val 120	Asp	Ile	Leu	Ile	Asn 125	Asn	Ala	Ser	
Val	Lys 130		Lys	Gly	Pro	Ala 135	His	Lys	Ile	Ser	Leu 140	Glu	Leu	Asp	Lys	
Lys 145		e Met	Asp	Ala	Asn 150	Tyr	Phe	Gly	Pro	11e	Thr	Leu	Thr	Lys	Val 160	
Leu	ı Lev	ı Pro	Asn	Met 165		Ser	Arç	, Arg	Thr 170	Gly	/ Gln	Ile	Val	Leu 175	Val	
Ası	n Ası	n Ile	e Glr 180		Lys	Ph∈	e Gly	7 Ile 185	e Pro	o Ph∈	e Arg	Thr	Ala 190	a Tyr)	Ala	
Ala	a Se:	r Lys 195		s Alá	a Val	L Met	Gl ₃		e Phe	e Asp	o Cys	Leu 205	Arc	g Ala	a Glu	

	Glu 210	Glu	Tyr	Asp	Val '	Val 215	Val	Ser 1	Thr	Val	Ser 220	Pro '	Thr	Phe	Ile	
Arg 225	Ser	Tyr	Arg	Ala	Ser 230	Pro	Glu	Gln <i>l</i>	Arg	Asn 235	Trp	Glu	Thr	Ser	Ile 240	
Cys	Lys	Phe	Phe	Cys 245	Arg	Lys	Leu	Ala '	Гуг 250	Gly	Val	His	Pro	Val 255	Glu	
Val	Ala	Glu	Glu 260	Val	Met	Arg	Thr	Val . 265	Arg	Årg	Lys	Lys	Gln 270	Glu	Val	
Phe	Met	Ala 275	Asn	Pro	Val	Pro	Lys 280	Ala	Ala	Val	Phe	Ile 285	Arg	Thr	Phe	
Phe	Pro 290	Glu	Phe	Phe	Phe	Ala 295	Val	Val	Ala	Cys	Gly 300	Val	Lys	Glu	Lys	
Leu 305		Val	Pro	Glu	Glu 310	Gly										
<21 <21	0> 1 1> 9 2> D 3> M	33	uscu	lus												
	1> C	DS '	(933)												
			•	•												
ato	Gly	ricto	ato	act	Val	ctg Leu	atg Met	cta Leu	ccc Pro 10	Leu	ctg Leu	ctg Leu	ctg Leu	gga Gly 15	atc Ile	48
ato Met	. Gly	teu	atg Met	gct Ala 5 tto Phe	Val	Leu	Met caq	Leu	Pro 10 gca	Leu tcc	Leu agg	Leu rctg	tgg	15 tcc Ser	rre	48 96
ato Met ago Ser	. G17 . G27 . G17 . G36	tev Lev Lev	atg Met ctc Leu 20 cag	gct Ala 5 ttc Phe	Val att	tac Tyr	Met cag Gln	gag Glu 25 gtc Val	Pro 10 gca Ala	Leu tcc Ser	agg Arg	Leu ctg Leu	tgg Trp 30	15 tcg Ser	, lle , , aag	
ato Met l ago Ser tot	g ggg	c ctc y Lev c gtc a Val 3: a aac y Ly:	atg Met ctc Leu 20 g cac	gct Ala 5 ttc Phe	Val	tac Tyr gtg Val	Met cag Gln gtg Val	gag Glu 25 gtc Val	Pro 10 gca Ala atc	tcc Ser aca Thr	Leu agg Arg gat Asr	Leu ctg Leu Deu Ala 45 ggg Gly	tgg Trp 30 atc	tcg Ser	g aag Lys	96
ato Met] ago Ser tot Ser cto	g ggg Gly Gly Gg ct-	c ctc y Lev c gtg a Val 35 a aag y Ly:	atg Met Cctc Leu 20 Glr Glr Glr Glr	gct Ala 5 ttc Phe gaac n Asr g tgt 1 Cys	val attelle aaa Lys gcts Ala	tac Tyr gtg Val cgg Arg 5: tgg Tr	Met cag Gln gtg Val gtg yal	gag Glu 25 gtc Val gttc Phe	gca Ala atc Ile cat	Leu tcc Ser aca Thr gca Ala	agg Arg Arg Gat Gly 60 g agg	ctg Leu Leu As As Ggg Gly	tgg Trp 30 ato	tco Ser tca Ser a ago	g aag Lys a gga Gly	96 144
ato Met I ago Ser tot Ser tto Le Va 6	g ggg c Gly c ggc c Gly c gcc c Ala g gga u Gly g ct l Le	c ctc y Lev c gtc a Val 3: a aag y Ly: 0 g tg	atg Met Ctc Leu 20 Glr Glr Glr Glr Glr	g gct Ala 5 ttc Phe g aac n Asr g tgt 1 Cys a aac	Val att Ile aaa Lys Ala gaac Asr 70 t gac a Asr	tac Tyr gtg Val cgg Arc Trr	Met cag Gln gtg Val gtg Val g gtg Gli g gac	gag Glu 25 gtc Val ttc Phe	Pro 10 gca Ala atc Ile cat His	Leu tcc Ser acae Thr gcae Ala g gae u Glu 7!	agg Arg Arg Asr Asr 60 g agg Se:5	c ccc	tgg Trp 30 atc Ile	tco Ser tca Ser a ago a Aro t gc t Al	g aag Lys a gga Gly g ctg Leu c acc a Thr	96 144 192

gtc Val	Leu	gac Asp 115	tgc Cys	tac Tyr	ggc Gly	tgt Cys	gtg Val 120	gac Asp	atc Ile	ctc Leu	atc Ile	aac Asn 125	aat Asn	gcc Ala	agc Ser	384
gtg Val	aaa Lys 130	gtg Val	aag Lys	ggg ggg	cct Pro	gcc Ala 135	cac His	aag Lys	att Ile	tcc Ser	ctg Leu 140	gag Glu	ctt Leu	gac Asp	aaa Lys	432
aag Lys 145	atc Ile	atg Met	gat Asp	gcc Ala	aac Asn 150	tac Tyr	ttc Phe	gga Gly	ccc Pro	atc Ile 155	act Thr	tta Leu	acc Thr	aaa Lys	gtt Val 160	480
ctg Leu	ctt Leu	ccc Pro	aac Asn	atg Met 165	atc Ile	tcc Ser	agg Arg	aga Arg	aca Thr 170	ggc Gly	cag Gln	att Ile	gtg Val	tta Leu 175	gtg Val	528
aac Asn	aac Asn	atc Ile	caa Gln 180	gcg Ala	aag Lys	ttt Phe	gga Gly	atc Ile 185	ccg Pro	ttc Phe	cgc Arg	aca Thr	gct Ala 190	tat Tyr	gca Ala	576
gcc Ala	tct Ser	aag Lys 195	cat His	gcc Ala	gtc Val	atg Met	ggc Gly 200	ttc Phe	ttt Phe	gac Asp	tgc Cys	ctc Leu 205	cga Arg	gcc Ala	gag Glu	624
gtt Val	gag Glu 210	gaa Glu	tac Tyr	gat Asp	gtt Val	gtg Val 215	gtc Val	agc Ser	acc Thr	gtg Val	agc Ser 220	Pro	act Thr	ttc Phe	atc Ile	672
cgc Arg 225	Ser	tac Tyr	cgt Arg	gct Ala	tcc Ser 230	cct Pro	gag Glu	caa Gln	aga Arg	aac Asn 235	Trp	gag Glu	aca Thr	tcc Ser	att Ile 240	720
tgt Cys	aaa Lys	ttc Phe	ttc Phe	tgc Cys 245	agg Arg	aag Lys	cta Leu	gcc Ala	tat Tyr 250	Gly	gtg Val	cac His	ccg Pro	gtg Val 255	gag Glu	768
gtg Val	gct Ala	gag Glu	gaa Glu 260	Val	atg Met	cgc Arg	aca Thr	gta Val 265	Arg	agg Arg	ı aaçı Lys	aag Lys	caa Gln 270	Glu	gtg Val	816
ttc Phe	atg Met	gcc Ala 275	Asn	ccg Pro	gtt Val	cct Pro	aag Lys 280	Ala	gco Ala	gto Val	g tto L Phe	285	Arc	aco Thr	ttc Phe	864
tto Phe	cct Pro	Glu	tto Phe	ttc Phe	tto Phe	gct Ala 295	a Val	g gto Val	gco Ala	tgt a Cys	ggg s Gly 300	y Val	g aaq L Lys	g gaç s Glu	g aag 1 Lys	912
cto Leu 305	aat 1 Asr	gto Val	cca Pro	a gaa o Glu	gaq Glu 310	ı Gl	<u>.</u> Y									933

: